# Lab3_Bonus

September 24, 2017

In [53]:
```
import pandas as pd
import numpy as np
```

In [12]:
```
data = pd.read_csv('ngrams-output.txt',sep = '\n',header = None)
```

In [13]:
```
data.columns = ['a']
```

In [21]:
```
data.head
```

Out[21]:
```
<bound method NDFrame.head of                                 a
0      (1564, 8.95897435897436)
1                 (1568, 8.9375)
2     (1572, 10.86864406779661)
3     (1574, 9.798076923076923)
4     (1582, 9.938983050847458)
5     (1584, 9.859756097560975)
6                   (1588, 9.7)
7     (1590, 8.466989436619718)
8     (1592, 8.937106918238994)
9    (1594, 12.142857142857142)
10                (1598, 9.832)
11   (1600, 10.153295128939828)
12   (1602, 5.7272727272727275)
13    (1606, 8.594594594594595)
14    (1610, 7.866666666666666)
15     (1612, 9.72972972972973)
16                (1614, 10.375)
17   (1618, 10.413793103448276)
18    (1620, 9.106382978723405)
19    (1624, 9.962686567164178)
20    (1626, 9.645833333333334)
21                (1628, 10.875)
22     (1630, 9.87683284457478)
23    (1632, 10.96551724137931)
24   (1634, 10.240663900414937)
25    (1636, 8.869565217391305)
26     (1638, 8.90632318501171)
27    (1640, 8.696629213483146)
```

```
28     (1642, 7.82051282051282)
29    (1644, 9.903419316136773)
..                          ...
395   (1959, 9.921816098977523)
396   (1961, 9.845579194365698)
397   (1963, 9.899037046700808)
398   (1965, 9.845548066952784)
399   (1967, 9.878510422578803)
400   (1969, 9.826507100795467)
401   (1971, 9.888930615152034)
402   (1973, 9.841120218165624)
403   (1975, 9.804956605112249)
404   (1977, 9.791682083327476)
405   (1979, 9.802351405104226)
406   (1981, 9.761339697764583)
407   (1983, 9.794734450150585)
408   (1985, 9.761445831650367)
409   (1987, 9.738816909839922)
410   (1989, 9.710144230777455)
411   (1991, 9.679409295296683)
412   (1993, 9.681129990307564)
413   (1995, 9.669703832600856)
414    (1997, 9.64522427520491)
415   (1999, 9.622537124815894)
416   (2001, 9.598801263623741)
417   (2003, 9.584914653965292)
418    (2005, 9.57700619486979)
419   (2007, 9.589189270312401)
420   (1505, 8.619047619047619)
421   (1507, 8.361702127659575)
422   (1515, 9.918067226890756)
423                (1525, 13.0)
424                 (1527, 9.6)

[425 rows x 1 columns]>
```

In [165]:
```
year = []
ave = []
num_dict = {}
```

In [166]:
```
import collections

def function(data):
    #num_list = data.loc[0].tolist()[0].replace('(','').replace(')','').split(',')
    num_list = list(data)
    for num in num_list:
        num = num.replace('(','').replace(')','').split(',')
        num = list(map(float,num))
```

```
            i = iter(num)
            num_dict.update(dict(zip(i,i)))

            # sort by year
            od = collections.OrderedDict(sorted(num_dict.items()))
        for k,v in od.items():
            year.append(k)
            ave.append(v)
```

```
In [167]: data.apply(function,axis = 0)
```

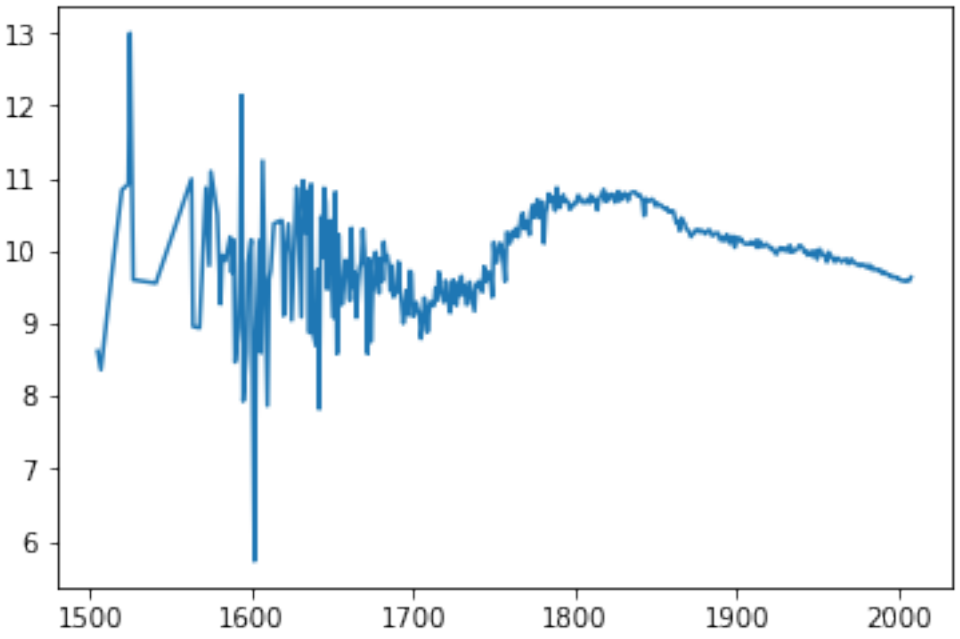
```
Out[167]: a    None
          dtype: object
```

```
In [168]: len(year)
```

```
Out[168]: 425
```

```
In [173]: import matplotlib.pyplot as plt

          plt.plot(year, ave)
          plt.figure(figsize=(20,10),dpi=80, facecolor='w', edgecolor='k')
          plt.show()
```



```
<matplotlib.figure.Figure at 0x1173833c8>
```

```
In [127]: a = ['11','12']
          a = list(map(int,a))
          i = iter(a)
          b = dict(zip(i,i))
          b

Out[127]: {11: 12}

In [138]: d = {2:3, 1:89, 4:5, 3:0}

          od = collections.OrderedDict(sorted(d.items()))

          od

Out[138]: OrderedDict([(1, 89), (2, 3), (3, 0), (4, 5)])
```